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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/556,712

11/09/2005

Kenji Suzuki

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EXAMINER

NGUYEN, HUNG

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/556,712	<b>Applicant(s)</b> SUZUKI, KENJI	
	<b>Examiner</b> Hung Henry V. Nguyen	<b>Art Unit</b> 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 20 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 52-111 is/are pending in the application.
- 4a) Of the above claim(s) 66-85 and 90-111 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 52-55, 57, 59-62 and 86-89 is/are rejected.
- 7) ☒ Claim(s) 56 and 63-65 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/9/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/9/05</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of group I (claims 52-65 and 86-89) in the reply filed on October 20, 2008 is acknowledged. The traversal is on the ground(s) that:

Applicant states that “Group I, as stated in the RR has been classified in subclass 52” and “Group IV, as stated in the RR has been classified in subclass 67”, then applicant argues “the reasons for classifying group IV (sic) appears “nearly” identical to the reasons for classifying group IV”, and applicant concluded that “inclusion of Group IV with Group I appears appropriate and hereby request”; the Examiner respectfully disagrees with the applicant. A review of record demonstrates that the Examiner has followed restriction practice as set forth on MPEP 806.05 (d) and the claims are related as sub-combinations disclosed as usable together. While claims of group I are related to an illumination system having a collimator, a fly-eyes mirror with a particular structure, along with a condenser for correcting at least a portion of the illumination irregularities in the illumination area, the claims of IV are specifically drawn to an illumination optical system having multiple reflecting members and correction means with optical characteristics for correcting illuminating irregularities in the illumination area, the optical characteristics being established in accordance with data concerning the reflectivity distribution. Therefore, the claims of group I and IV are clearly independent and distinct and the Examiner has demonstrated that they are.

Turning to group III, it is noted that the claims of Group III of the present application are explicitly drawn to an illumination optical system having a multiple reflecting members having

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reflecting surface coated with multilayer film and correction means placed at a position that is optically conjugate with the illumination area or at a position that is shifted a prescribed amount from the optically conjugate position having optical characteristics serving to correct illumination irregularities. As such, the claims of group I and group III have different structures, modes of operation and functions to correct illumination irregularities in the illumination area. Clearly, the claims of group I and III are independent and distinct and the Examiner has demonstrated that they are.

With respect to group V, the claims of group V are specifically related to a projection exposure system and method for adjusting the projection exposure system for correcting irregularities from a non-uniform distribution of optical intensity of polarized light at reticle or at substrate. Applicant states that this classification is not understood since “none of the claims in this group states anything about controlling electricity to a lamp”; the Examiner respectfully disagrees with the applicant, the best home of these claims are class 355/69 since they are related to “illumination and details” and “non-uniform distribution of optical intensity of polarized light”. Clearly, the claims of group I and V are independent and distinct and the Examiner has demonstrated that they are.

Lastly, claims of group II are related to an illumination optical system having multiple optical members for guiding a prescribed light to an illumination area and correcting means for correcting illumination irregularities arising from a non-uniform optical intensity distribution of polarized light in the illumination area wherein the correction means comprises first correction member for correcting the illumination irregularities of the first polarization component of light and a second correction member for correcting the illumination irregularities of the second

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polarization components of the light illuminating the illumination area. Thus, the structure, mode of operation and function of the illumination optical system of group II are totally different with the structure, mode of operation and function of the illumination optical system of group I. Clearly, the claims of group I and II are independent and distinct and the Examiner has demonstrated that they are. For the above reasons, applicant's arguments are not found persuasive. As discussed, the present application contains many different inventions, the distinct and separate searches are quite extensive and places a serious burden on the Examiner in regard to both search and examination. The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the

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reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 52-55, 57, 59-62 and 86-89 are rejected under 35 U.S.C. 102(b) as being anticipated by Koch et al (U.S.Pat. 6,195,201).

With respect to claims 52 and 59, Koch et al discloses an illumination system comprising all of the structures set forth in the instant claims such as: a light source (12) that emits extreme ultraviolet light (EUV); a collimator (14) located downstream of the light source; a fly's eye mirror (16, 18) located downstream of the collimator and having a multiple unit mirrors (see figure 3A) and a condenser (20,22) located downstream of the fly's eye mirror and having an emission side; wherein the illumination optical system Köhler illuminates a desired illumination area (24) on the emission side of the condenser, the illumination are including one or more illumination irregularities and at least one of the unit mirrors of the fly-eye mirror is a correction mirror having reflectivity irregularities configured to correct at least a portion of the one or more illumination irregularities in the illumination area (see col.5, lines 10-59).

As to claims 53 and 60, it is disclosed that the fly's eye mirror (16,18) has a number of correction mirrors (42), the number being one or more (see figures 3A) and a ration of the number of correction mirror (42) to the number of unit mirrors of the fly's eye mirror has a value that is according to an extent of the illumination irregularities (see figures 3A and 4A-4B and col.5, lines 60 to col.6, line 15).

With respect to claims 54 and 61, Koch et al disclose each unit mirror and correction mirror (42) has a respective reflecting surface (46) coated with a respective multilayer film to improve reflectivity of the reflecting surface to the EUL light and the multilayer film on each

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correction mirror has a respective distribution of number of layers across the reflecting surface, the distribution corresponding to the respective reflectivity irregularity of the correction mirror (see col.5, lines 54-56) and the facet or element 42 has dimensions of approximately seven by ninety-three millimeters (see col.5, lines 48-50).

As to claims 55 and 62, Koch et al discloses the unit mirrors of the fly's eye mirror (16, 18) and at least one correction mirror has respective orientations at which EUV light from the light source (12) is incident at respective oblique angles of incident and the angle of incidence are within a range of total-reflection angles (see col.7, lines 61-65) and each correction mirror has a surface structure including at least one feature configured to have a distribution sufficient to define the respective reflectivity irregularities (see col.9, lines 4-15).

As to claims 86-89, Koch et al discloses a reticle (25) and a substrate (28) and a projection system (11) for projecting an image formed on the reticle onto the substrate. Although, Koch et al do not expressly disclose the claimed reticle stage and the claimed substrate stage, these elements are inherent teachings of the illumination system of Koch et al and they must be present for the system to function as intended.

#### ***Allowable Subject Matter***

4. Claims 56, 63-65 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record either alone or in combination, neither discloses nor makes obvious a

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combination of an illumination optical system comprising among other features, a fly-eye mirror located downstream of a collimator and having multiple unit mirrors with particular structures and satisfying conditions as recited in the instant claims.

***Prior Art Made of Record***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tsuji (U.S.Pat. 6,885,432); and Mori et al (U.S.Pat. 5,594,526) disclose illumination optical systems and have been cited for technical background.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on 571-272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/Hung Henry Nguyen/  
Primary Examiner  
Art Unit 2851**

hvn  
12/9/08